Problems in Thailand's smallholder supply chains

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Abstract

This report examines the supply chain challenges faced by smallholder farmers in Thailand. Using a combination of questionnaires, a comprehensive literature review, and data analysis, the report investigates key factors affecting smallholder agricultural supply chains. These factors include the impact of smallholder commodity prices on access to broader agricultural commodity markets, limited access to financial services, delays in agricultural technology adoption, and seasonal variations that affect crop yields. The findings indicate that smallholders are particularly vulnerable to crop price volatility caused by technological delays and seasonal variations, creating significant risks at the supply chain level. In addition, restrictions on financial services exacerbate these issues, limiting smallholders' ability to invest in technological advances or stabilize operations during the off-season. The report concludes with recommendations for improving technical support, broadening smallholder financing channels, and price stability in smallholder markets to enhance the quality of Thailand's smallholder supply chains.

Keywords: Agricultural, Smallholder, Supply Chain

1. Introduction

At the present moment, the agricultural supply chain of small farmers in Thailand has problems such as low transportation efficiency, excessive inventory, and large losses of agricultural products. Due to the large number of middlemen between farmers and customers, small farmers and customers cannot communicate directly, which aggravates the delays and omissions in some links of supply chain management. At the same time, the appreciation of the Thai baht and the rising production costs have also brought greater risks and challenges to the management of agricultural supply chains in Thailand.

1.1 Research Objective

To improving the income level of small farmers in Thailand. In 2019, the average annual agricultural income of households nationwide was estimated to be 86,319 baht, about US$2,394. In early 2023, Winnie, Deputy Secretary-General of the Agricultural

Economic Office of the Ministry of Agricultural Cooperatives of Thailand, released the statistical data on the financial income and expenditure of Thai farmers' households in 2021-

2022. The results showed that the average annual agricultural net income of farmers' households from May 2021 to April 2022 was 113,590 baht, about US$3,000. In 2023, the average annual income of agricultural households in northern regions such as Chiang Mai, Chiang Rai and Loei, which mainly rely on agricultural income, is estimated to be 92,773 baht, or about $2,574. At the same time, the average annual income per capita in Thailand is about 184,260 baht, or about $5,270. This shows that the average income of small farmers is purely half of the national average income level. Improving the income level of small farmers will become an important factor and reason. And reduce agricultural and agricultural product losses and waste.

Due to many factors such as high storage costs, poor storage conditions and unsecured transportation, Thai agricultural products face high loss rates before and after they are sold. According to the annual report on agricultural production and losses issued by the Thai Ministry of Agriculture, the loss rate of Thai fruits and vegetables during storage and transportation has been as high as 25% in recent years. According to a report by the Thai Ministry of Commerce in 2022, the loss of agricultural products causes Thailand to lose about 100 billion baht (about 3 billion US dollars) each year.

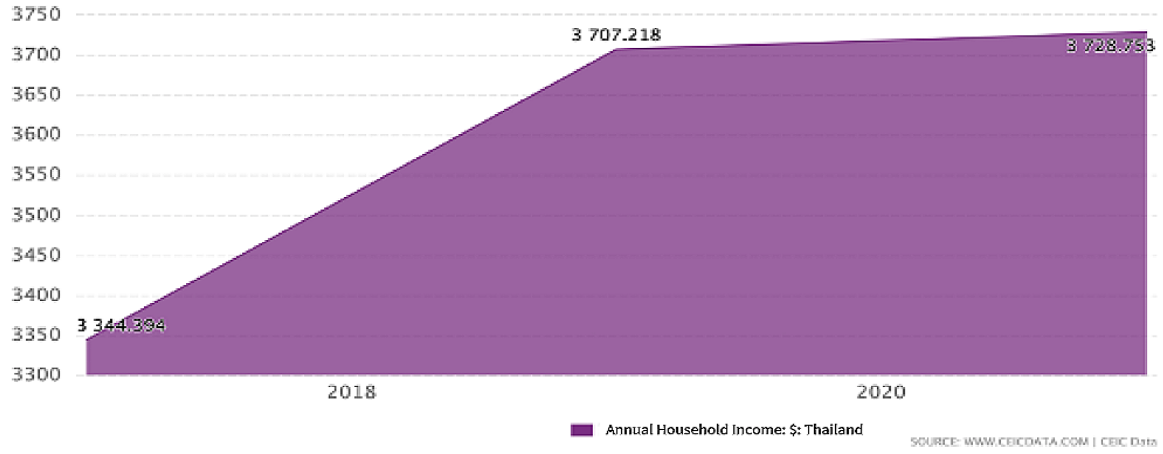

Figure 1: The Income of Thailand smallholders

2. Literature Review

2.1 Concepts of The Agricultural Supply Chain

Agri-food supply chains (AFSC) is a set of activities in a “farm-to-fork” sequence including farming (i.e., land cultivation and production of crops), processing/production, testing, packaging, warehousing, transportation, distribution and marketing (Routroy & Behera, 2019).

2.2 Foreign Experiences about Innovation of Agricultural Supply Chain

The U.S. Department of Agriculture's Regional Food Business Centers Program announced earlier this year it is creating 12 hubs across the country to build resilient food systems by helping small and mid-sized farm businesses scale operations. The program will distribute $400 million in funds from 2021's American Rescue Plan over five years, and the centers will serve 11 different geographical regions around the US and its territories, as well as tribal lands. These 12 'mini USDAs' are helping small farmers break into new markets Regional hubs across the country are supporting the growth of local agriculture, tailoring services based on the area of the country and the farmers involved (Alexandra, 2024).

2.3 Local Experiences about Innovation of Agricultural Supply Chain

Thailand's agriculture is mostly driven by small-scale farmers individually cultivating crops. Since 2016, the government encourages farmers to establish cluster farms (see box next page), which consist of a group of more than 30 farmers cultivating the same main crop. To take the cluster farm approach to the next level, AFC developed a specific extension concept together with the Thai Department of Agricultural Extension (DOAE). Upgrading of the cluster farm management and cooperation of the members towards an agribusiness, introducing SMARTfarming technology as well as improving agricultural practices are the three pillars of the concept. In addition, common marketing and optimised logistics and higher bargaining power shall stimulate higher revenues (GOPA AFC, 2022).

3. Methodology

3.1 Research Design

Five hypotheses were proposed in this research report, and data were collected by making questionnaires for small farmers in Thailand based on their contents. This study aims to find out the problems that small farmers have in the production and transportation process.

3.2 Population and Sample

The target population included smallholder farmers aged 18 years and above who were residing and living in Thailand for a long time. A questionnaire survey was used to randomly select 200 respondents. This sample size was determined to ensure the statistical validity and to make meaningful summaries of the results.

3.3 Data Collection

Data were collected over a 3-week period using an offline questionnaire survey. The respondents were guaranteed privacy and informed of the purpose of the survey.

3.4 Data Analysis

This study used traditional graphical statistical methods to analyze the data to determine the relationship between a combination of factors such as weather, finance, and information asymmetry and the supply chain of smallholder farmers in Thailand

4. Results

The study explores various hypotheses related to smallholder farmers in Thailand, focusing on market access, transportation, credit, seasonality, and technology adoption.

Hypothesis 1: Access to Market Information
Farmers commonly receive market price information "sometimes" (34%) or "often" (29%). Moderate trust in pricing from wholesalers/brokers is reported by 34%, while only 9% express high confidence. Market data is mainly sourced from wholesalers (35%) and fellow farmers (32%).

Hypothesis 2: Transportation Challenges
Shipping methods are mostly rated as "fair" (35%), while 30% spend 20-30% of their income on transportation. Lateness is frequent, with 32% "often" and 31% "sometimes" delayed. Transportation costs significantly reduce net income, with 35% strongly agreeing.

Hypothesis 3: Loan Accessibility
57.14% of respondents have applied for loans, but only 36.09% had approvals. Farmers fund technological improvements via government support (23.31%), personal savings (19.55%), or bank loans (19.55%). Mixed opinions on loans' impact reveal a potential but inconsistent influence on efficiency.

Hypothesis 4: Seasonality Effects
Seasonal variations significantly affect crop production, with 27.07% reporting a "moderate effect" and 25.56% a "high effect." Off-season income sources include other jobs (30.83%) and government aid (27.07%). Predicting farm income remains challenging, with most stating it is "not predictable" (25.56%).

Hypothesis 5: Technology Adoption
Farmers primarily use "some modern equipment" (27.07%) or "basic tools" (25.56%). Training updates occur "occasionally" (30.83%). Challenges in meeting market standards persist, with 24.81% finding it "hard work" and 22.56% deeming it "very challenging."

This analysis highlights the hurdles faced by Thai smallholder farmers in market access, transportation, credit, seasonality, and technology, suggesting a need for targeted interventions.

5. Discussion and Conclusion

The research confirms five key hypotheses about smallholder farmers in Thailand, revealing their challenges and potential areas for improvement.

Hypothesis 1: Access to Market Price Information

Proven. Many farmers receive market price information “sometimes” (34%) or “often” (29%). Women and older farmers tend to trust wholesalers less, whereas younger or male farmers actively seek direct information. A new challenge is improving trust in pricing sources for better decision-making.

Hypothesis 2: Transportation Issues
Proven. High transportation costs negatively impact farmers' income, with 35% strongly agreeing. Farmers in remote areas and women face greater delays and inefficiencies due to limited access to cost-effective transport. A key issue is finding alternative transportation methods to minimize income loss.

Hypothesis 3: Access to Loans
Proven. While 57.14% applied for loans, only 36.09% were approved, demonstrating significant barriers to financial assistance. Younger farmers are more likely to apply but face higher rejection rates due to lack of collateral, while older farmers depend more on savings or government aid. Improving loan approval rates is a critical challenge.

Hypothesis 4: Seasonality's Impact on Crops
Proven. Seasonality moderately (27.07%) to severely (25.56%) affects crop production. Farmers in regions with extreme weather, particularly women and older farmers, struggle more to adapt due to limited access to modern techniques. Ensuring income stability during the off-season is a pressing need.

Hypothesis 5: Adoption of Agricultural Technology
Proven. While many farmers use modern equipment (27.07%) or basic tools (25.56%), adoption is limited by education and training gaps. Younger farmers and those with higher education are more likely to adopt technology, while women face additional barriers. Providing adequate training and resources is essential.

Recommendations:

- Enhance Market Information Access

Develop a digital platform delivering real-time market price data accessible to all farmers.

- Subsidize Transportation Costs

Introduce shared transportation services or subsidies through cooperatives or government programs to alleviate costs.

- Expand Financial Access

Implement microfinance tailored to farmers, focusing on women and younger applicants to overcome resource limitations.

- Support Seasonal Income Diversification

Promote off-season crops and alternative income activities to mitigate the effects of seasonality.

- Provide Technology Access and Training

Expand training programs and make agricultural technology accessible, focusing on women and less-educated farmers.

These interventions aim to address smallholder farmers' challenges in market access, transportation, finance, seasonality, and technology adoption, fostering resilience and sustainability.

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